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ABSTRACT

Designed to present interesting facts about science and to heighten the curiosity of primary age students, this book contains activities about the natural world and numerous black and white illustrations. The activities focus on signs of the four seasons. Materials are included for assembling a season activity booklet and guidelines are given for a seed-planting experience. A seasonal story and rhymes and riddles are highlighted. A section on weather is also offered. Directives for the individual activities are provided in the teacher/parent guide section and include: (1) discussion questions; (2) explanations of the learning activities with an answer key; (3) vocabulary list; and in most cases, (4) extended activities. (ML)

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A GOOD APPLE ACTIVITY BOOK FOR PRIMARY GRADES

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YOUNG SCIENTISTS EXPLORE

Seasons

BOOK 5 PRIMARY LEVEL

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By Linda Penn Illustrated by Elaine Scott

YOUNG SCIENTISTS EXPLORE

THE SEASONS

BOOK 5 — PRIMARY LEVEL

by

LINDA PENN

illustrated by **ELAINE SCOTT**

cover design by **TOM SJOERDSMA**

music by **MARY BETH PENN**

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PREFACE

Fellow Teachers and Parents,

As educators we are conscious of the enriching experiences available to young children through meaningful exploration of their environment. Many avenues of learning present themselves annually in the predictable patterns of the seasons. It is the purpose of **Young Scientists Explore the Seasons** to take advantage of youthful curiosity. With nature providing the framework, children will discover reasons for various seasonal events and attempt to effect some changes of their own with exciting "hands-on" science activities.

Each child will enjoy assembling a season activity booklet. Two covers are provided picturing a boy, a girl and an apple tree in appropriate attire for each of the four seasons. Trees, seeds and animals will help the children explore the effects of the seasons on living things. Following a suggested seed-planting experience, "The Season Tree Family Album" will encourage observational skills and record keeping in a unique, fun-to-use format. "The Tale of Agnes Apple" will become a favorite story to be read in its seasonal sequence, time and again. The well-known Woolly Bear Caterpillar will be looked at realistically in its role as a weather forecaster, along with other animals that wear a hairy coat for winter. Nature's principal weathermaker, the sun, will be involved in each science experience to aid in developing an awareness and appreciation for the sun's importance to all life.

The Teacher/Parent Guide, beginning on page 28, will furnish background for discussion, vocabulary development and extending activity suggestions. If I can be of further assistance, please let me know through Good Apple. Their address is listed on the inside front and back covers.

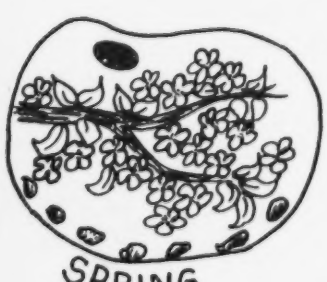
Reach out for the hands
of a curious child.
Sharing living science
can open young eyes
To the wonder and beauty of life.

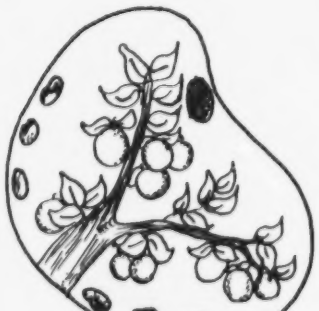
Sincerely,

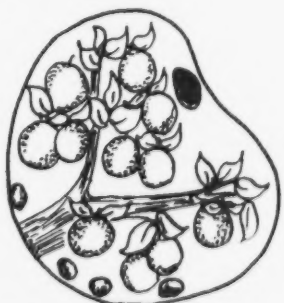
Linda Penn

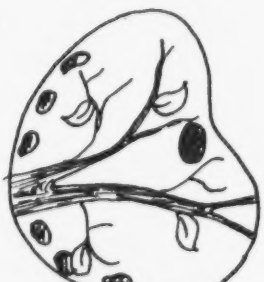
Signs of the Season

Seasons come and seasons go
bringing weather changes.
Often Nature's colors
each season rearranges.
Please finish your book covers.
What colors will you choose?
Read the "clues" so you will know
the colors best to use.

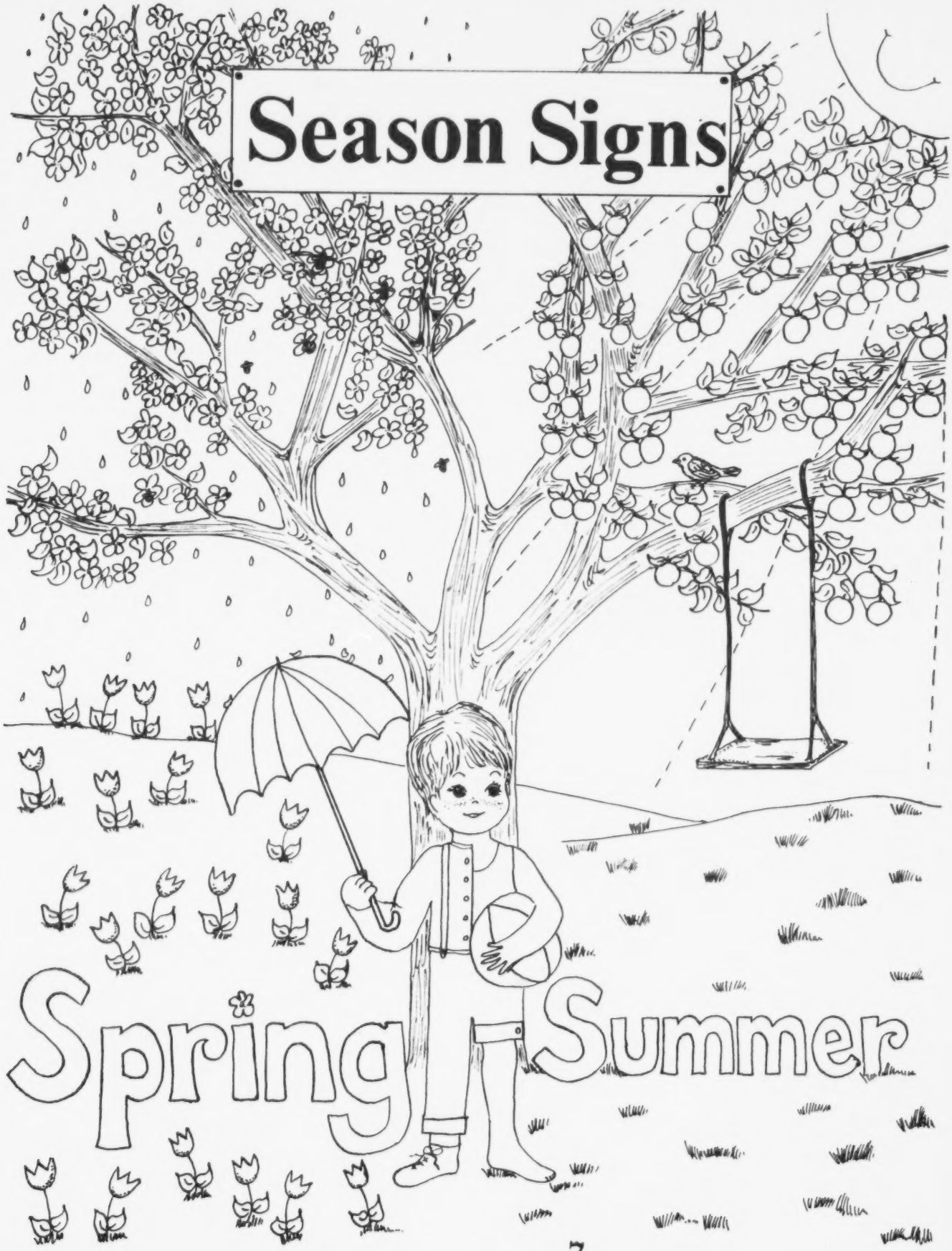

SPRING


SUMMER


FALL


WINTER

Season Signs



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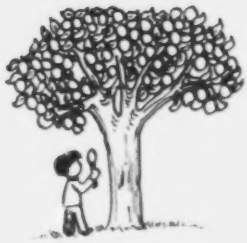
Seasonal Color Clues

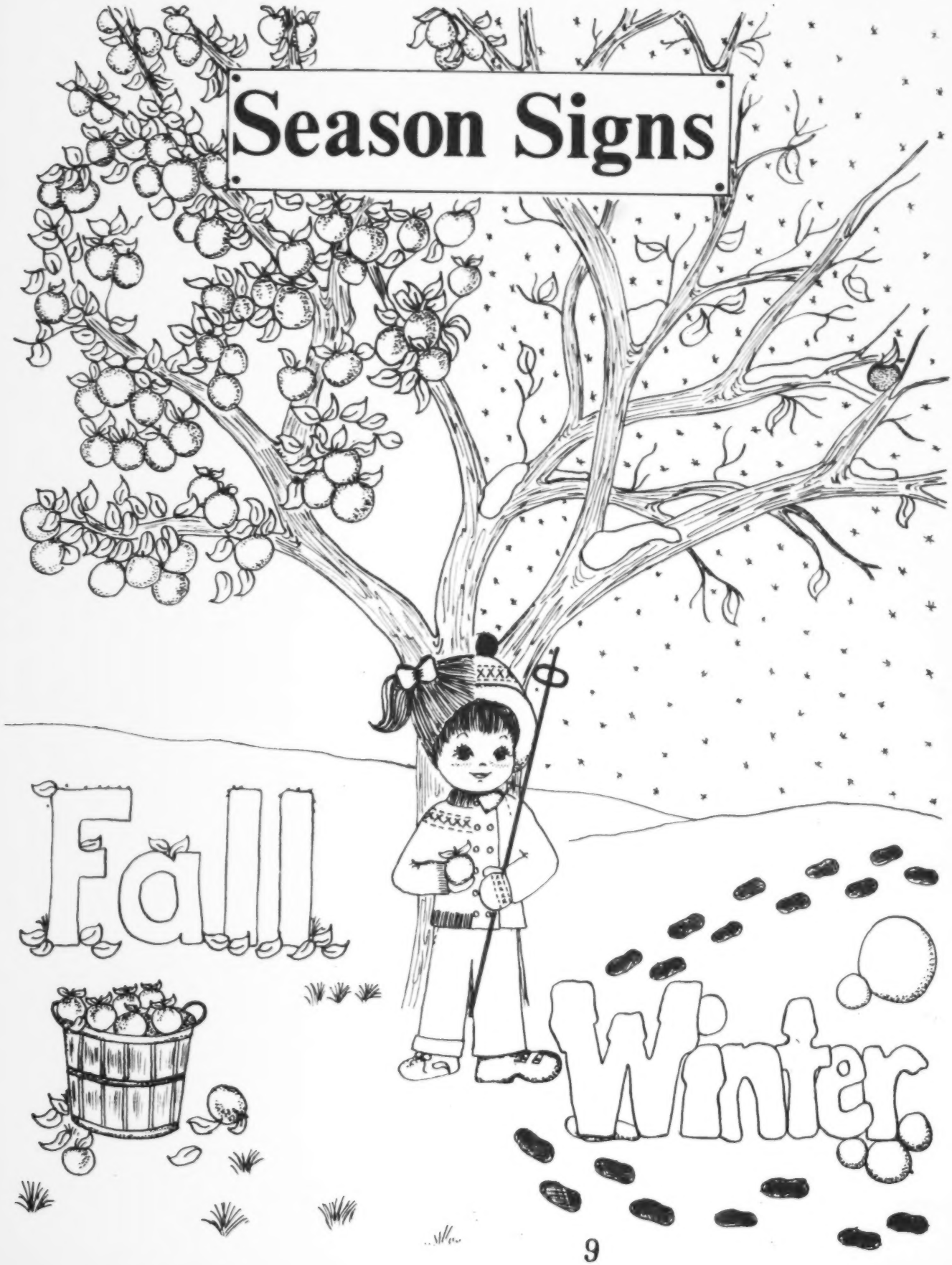


SPRING apple blossoms color pink.
Small SUMMER apples green.
FALL finds apples ripe and red.
In WINTER brown is seen.

[WINTER apples, found on the ground, could be yellow, red or brown.]

SPRING apple leaves are fresh and green. In SUMMER much the same is seen. FALL leaves lighten and some turn brown, while WINTER's leaves cover the ground.

SPRING and SUMMER green and growing! FALL and WINTER brown is showing.



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Plant a "Season Tree"

To learn MORE about the seasons,
we are going to plant a tree
and look for other members
in our tree's family.

Should the season be FALL
the tree will have seeds.
Three

are easy to grow.

So, which tree will it be?

Pick-a-Seed in Season

MAPLE TREE

seed

In SPRING and FALL, the winged seeds of the maple are readily started in a light soil as described below.

MAPLE TREE

leaf

APPLE TREE

(small apples)
CRAB

When planting apple seeds, it is best to use those of the Crab Apple. This is the original wild-apple variety and germinates from seed more successfully than seeds of commercially grown eating apples. Eating apples are the fruit of hybrids, not normally started from seed. Crab Apple Trees are often grown just as ornamentals, since the small fruit is bitter tasting and is not edible.

APPLE TREE

leaf

WHITE OAK

leaf

seed

The long, narrow acorns of the White Oak Tree sprout quickly (about 10 days), while the shorter, rounder Red Oak acorns are slower to germinate. These trees can be identified by their leaves; White Oak leaves will have rounded edges and Red Oak will be pointed.

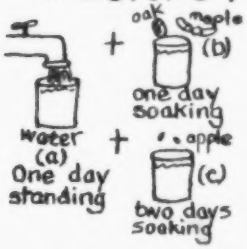
RED OAK

leaf

seed

Planting Guide

1. Before Planting: a) Let a cup of tap water stand at <u>room temperature</u> for 24 hrs. (This will remove chlorine.)



b) Allow oak and maple seeds to soak in <u>dechlorinated</u> water for one day.

c) Apple seeds should be <u>rubbed with a nail file</u> to remove part of the seed covering and then soaked in dechlorinated water for <u>two</u> days.

2. Plant seeds in light soil mixture of peat moss and humus.
3. After a seedling has sprouted and is about 15 centimeters high, transplant in a **heavier** growing mixture such as potting soil. (The soil can be kept fresh by placing charcoal granules in the bottom of the planting container.)
4. Use spray watering container to avoid overwatering and keep soil evenly moist.

The Season Tree Family Album

I am (circle one)

- an acorn seed
- an apple seed
- a maple seed

My parent tree is called:

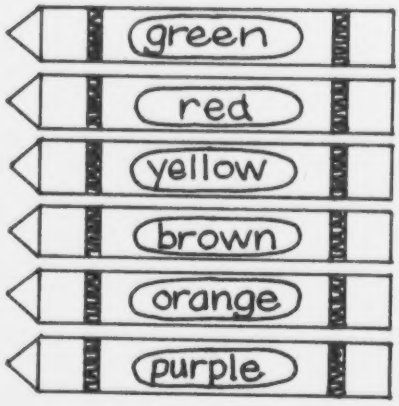
- White Oak ☐
- Red Oak ☐
- Crab Apple ☐
- Apple ☐
- Maple ☐

Its leaves look like this:

(Glue or draw leaf of tree)

In FALL the leaves on my family trees can be:

[Color the crayons that best describe the FALL leaves.]



changes in leaves observed on _____ (date).

There (had) (had not) been a frost before the leaves changed colors.

My family trees need

☐ frost and cold nights

☐ shorter daylight hours

to change the color of their leaves.

(Glue or draw seed here)

The seeds of trees in my family look like this.

These seeds are ripe and ready to grow in:

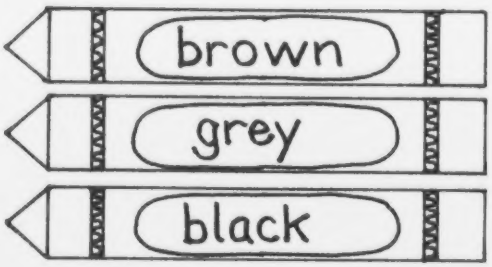
FALL ☐

SPRING ☐

SUMMER ☐

More about me....

When I grow up my branches and trunk will be:
[Color crayons best fitting description.]



(Glue piece of tree bark here.)

Trees in my family have bark that looks like this.

This is my picture when I was _____ centimeters.

It took ___ days for me to grow this tall.

I am cared for by:_____

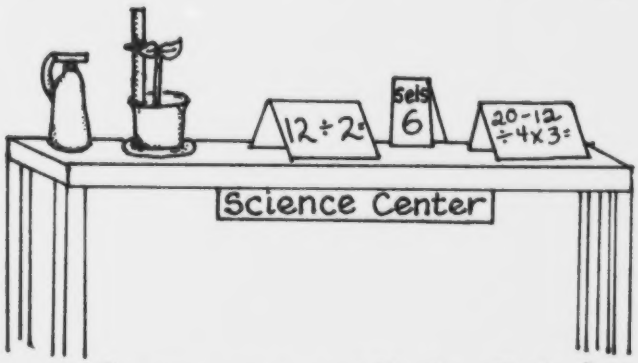
_____

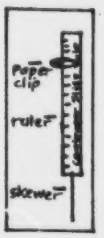
Draw Season Tree here or glue photograph of tree and children.

Planting with a Plus

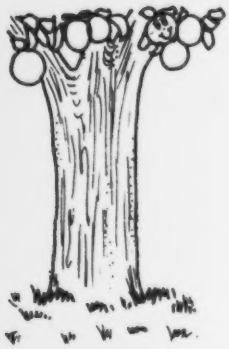
(Extending Activities)

Number cards can be made to indicate how many times the plant should be sprayed each day. For very young children it can be counting practice; for older children the number of sprays can be determined by the answer to an addition, subtraction, multiplication or division problem; if a foreign language is being studied, the number of sprays can be counted in that language. (Not only does this activity provide moisture for the plant, it can also be set up as a control to prevent overwatering.)





Make a Centimeter "Slide Rule" by cutting out the pattern on this page and backing it with similar-sized tagboard. (Optional: Glue or tape a wooden skewer to back of ruler, extending it at least 4 centimeters beyond the "soil line" marking at the bottom.) Add a large paper clip after shading one side of the clip with dark permanent marker or a small piece of colored tape. To use, student inserts "slide rule" next to plant, stopping at soil line marking. The paper clip is then moved to the correct measurement with the shaded side as an extended measuring guide. See Teacher/Parent Guide for record-keeping activity.



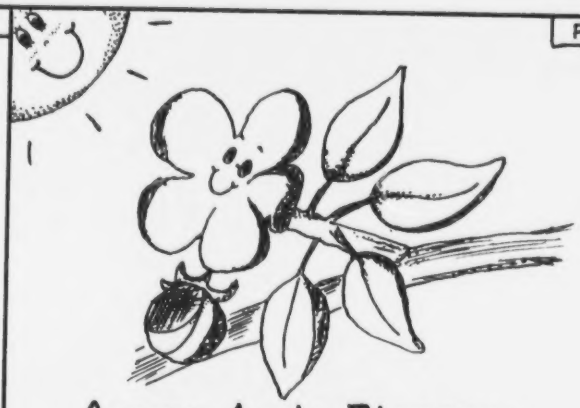
My name is Agnes Apple.
I will be your "Science Guide."
You can find me on each page,
although at times
I'll seem to hide.
You see the seasons change me
so

I must tell.
Please listen very carefully.
I will try to tell it well.

Part I.

Agnes Apple Bud

Part I.



Agnes Apple Blossom

Part I.

Honey Bee visits Agnes Apple Blossom.

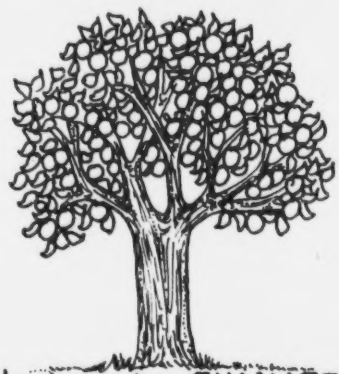
Part I.

Wind blowing Apple tree in SPRING.

Part I.

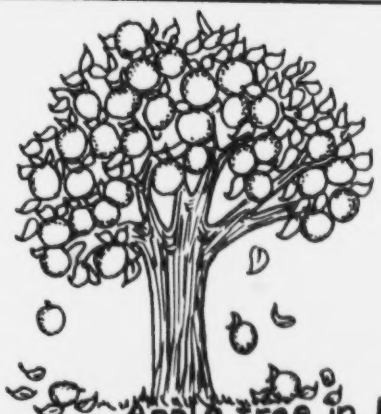
Agnes, the little yellow bump.

Part I.



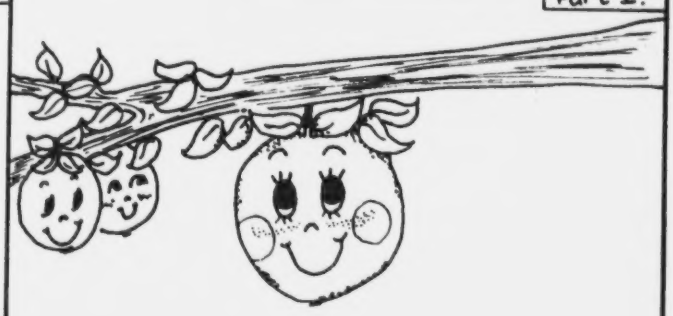
Apple tree in SUMMER...

Part I.



Apple tree in FALL...

Part I.



The reddest apple of them all !!!

The Tale of Agnes Apple

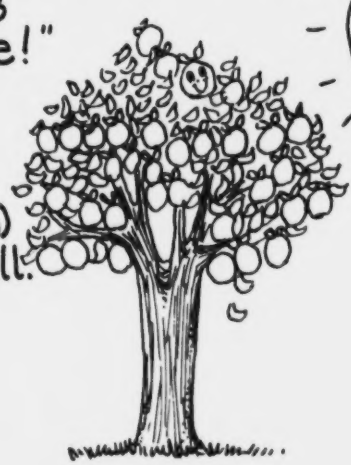
(Part I)

Once upon a time, quite early in the SPRING,
a tiny apple bud did its very special thing.
It stretched out pretty petals
to greet the springtime sun
and was a lovely apple blossom
before the day was done.

Now Agnes Apple Blossom
grew high up in a tree.
She tried to look her very best
so the springtime sun would see.
He smiled on her, most every day
and sent a honeybee
to sip her special nectar
and help her grow some seeds.

One day a sudden windstorm came
and shook the apple tree.
Poor Agnes watched her petals fall -
"Oh dear! Now look at me!!!
I'm just a yellow bump, and Mr. Sun won't look my way."
Whew! Was Agnes ever happy when he smiled again that day.
"I really feel like growing in all this warm sunshine.
Am I glad super Mr. Sun's
a special friend of mine!"

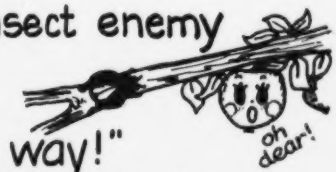
SPRING turned into SUMMER
and before long into FALL.
Soon Agnes (the little yellow bump)
was the reddest apple of them all.



Part II

There was a boy named Tommy, living on Apple Lane.
He loved to climb the apple trees
that gave his street its name.
Agnes grew at the very top of the tree in Tommy's yard,
but he had never climbed so high;
it looked a bit too hard.

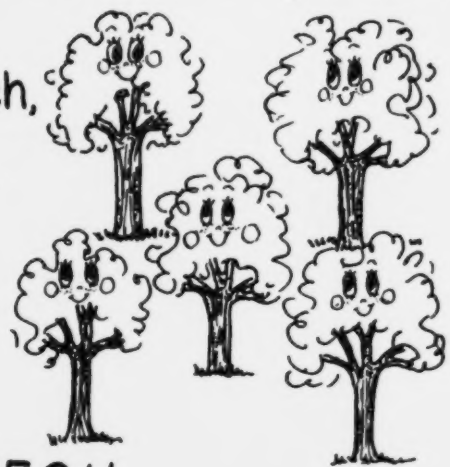
One cloudy day in early FALL, a hungry insect enemy
was spotted by pretty Agnes
as she hung helpless on the tree.
"Oh dear! My special apple life **cannot end** this way!"
Lucky for Agnes Apple, Tom was climbing trees that day.
He wore a brand-new pair of shoes
with traction soles for climbing
and soon had reached the very top
to find Agnes Apple shining!



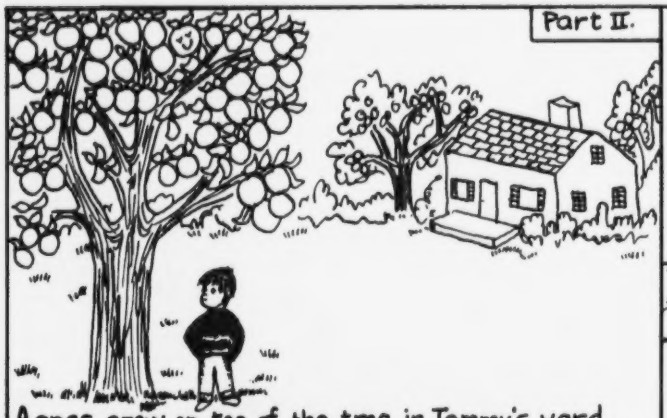
Mr. Sun had just come out to help his little friend.
Tommy saw her shining bright and picked her from the limb.
So it was that very day, Agnes left the apple tree,
riding in Tommy's backpack to become a special treat.

That afternoon when he had lunch,
Tom found (5) "five" shiny seeds!
One day he'd plant them in the sun
so they'd become

FIVE AGNES APPLE TREES!!

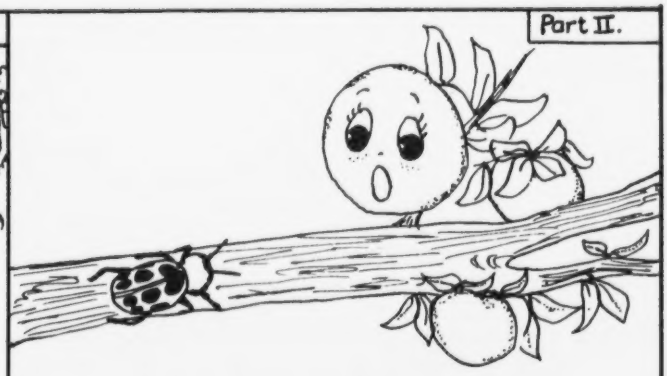


Part II.



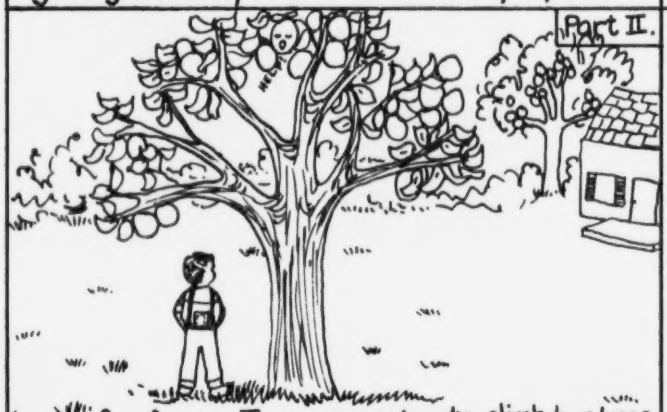
Agnes grew on top of the tree in Tommy's yard.

Part II.



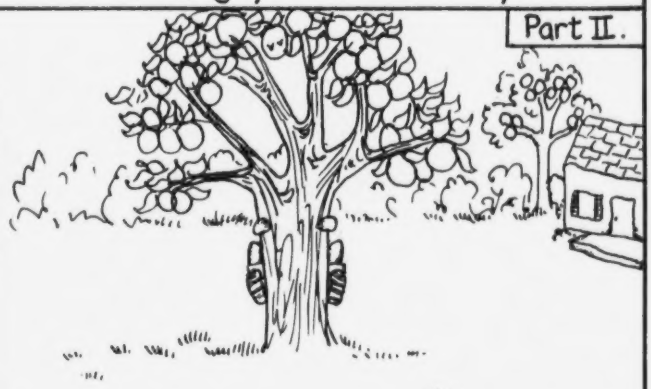
A hungry insect enemy!

Part II.



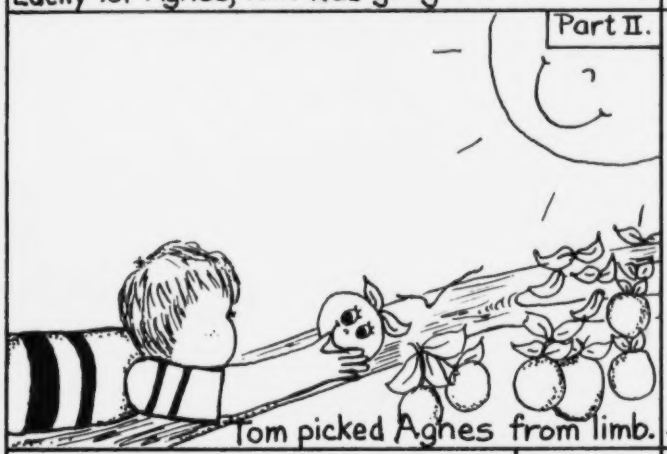
Lucky for Agnes, Tom was going to climb her tree.

Part II.



New traction-soled shoes helped Tom climb high.

Part II.

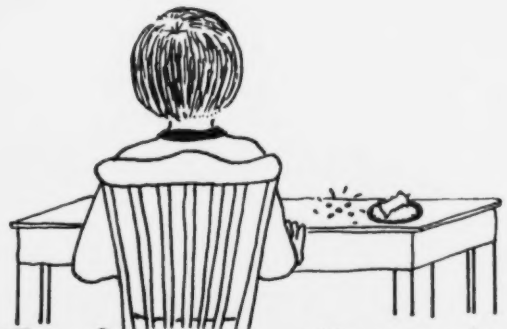


Tom picked Agnes from limb.

Part II.

Agnes left the apple tree riding in Tom's backpack.

Part II.



Tom found five shiny seeds.

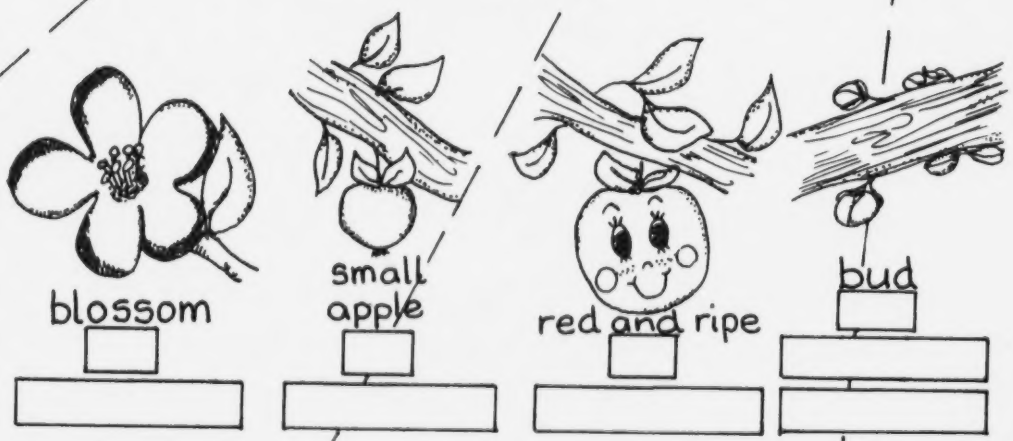
Part II.

On a sunny day, Tom would plant her seeds.

Sun-Warming Science

I'm sure you know
we need the sun,
or "life" just couldn't be.
Sunlight helps all living things
that grow and change....
like me!

Can you number my changes and name the season for each change?



Sunshine makes our weather
and all the seasons, too.
Without it, days would be dark nights.
We'd have WINTER's cold
all year through!

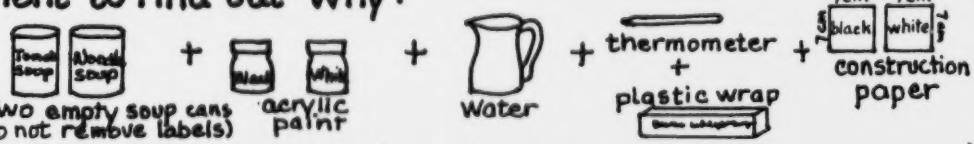
Solar Sun Scientists

Years ago some scientists thought about the sun how its warmth and energy could help to get jobs done.

So nowadays the sun heats homes. and runs powerful machines; thanks to these Solar Scientists our "Sunshine Energy Team"!

Science Experiment: Scientists discovered certain things soak up (absorb) the sun's warm rays faster than others. Inside a Solar (Sun) Furnace, metal water pipes used to absorb the sun's warmth, are painted black. Complete this experiment to find out why!

MATERIALS NEEDED:



Two empty soup cans (Do not remove labels) + acrylic paint + Water + thermometer + plastic wrap + construction paper

PROCEDURE: Paint one can black and one can white. Fill cans with water and cover each with a small piece of plastic wrap. Place construction paper squares on top of each can. Set both cans in direct sunlight for a few hours, then check the temperature of the water in each can.

RESULT: The ( ) white can or the ( ) black can had the warmer water after ____ hours in direct sunlight.

What did you learn from this experiment?

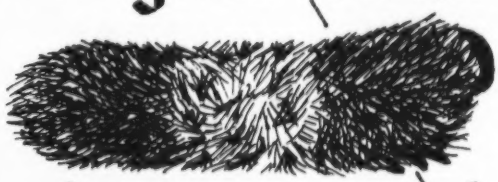
Do you think you would be more comfortable in ( ) light or ( ) dark-colored clothing on a hot SUMMER day?

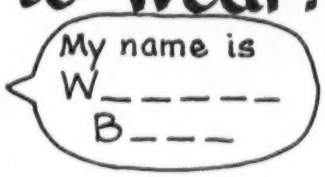
....( ) light or ( ) dark-colored clothing on a very cold, but sunny, WINTER day?

Additional suggestions for sun experiments detailed in Teacher/Parent Guide p. 29

Cold Weather Rhymes and Riddles

When the sun is not as warm
and cold WINTER's in the air,
here's a smart caterpillar
that know's just what to wear!





Color its hairy coat black
with a brown band in the middle.
If you name him Woolly Bear,
You have the answer to this riddle.

Caterpillar Quiz Corner

It is a fact that Woolly Bear Caterpillars can be mostly brown or almost all black in color. If "Woolly" could spend time in WINTER sunshine, would brown or black be the better color? Please help Woolly Bear by filling in the tree message from his friend Agnes Apple Bud. Be sure to complete the sun-warming experiment on page 17, beforehand.

The Woolly Weather Bear

There are those who say the "woolly" is a weather-telling bear. When its middle band is narrow, *WINTER's* cold will be severe. This, of course, is just a saying, for bands seldom look alike.

But - should their hair be very thick a colder WINTER is in sight!!!

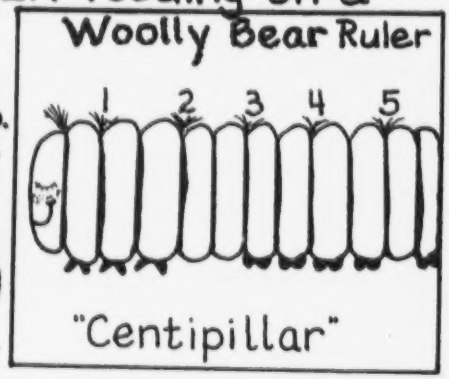
Caterpillar Corner

It is a fact that animals with hairy fur coats grow **thick** fur when the WINTER will be very cold. Can you name some other animals that have hairy coats to help them survive freezing WINTER weather???

Woolly Bear Hunt

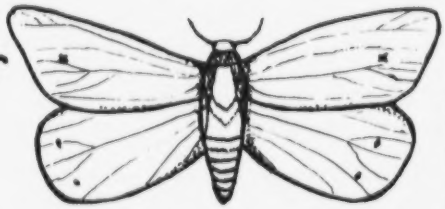
In late SUMMER or early FALL, WOOLLY BEARS will be getting ready for WINTER and can be found on the ground in woody or weedy areas among the leaves, sticks and other debris. This famous caterpillar is easy to identify with its furry black body, front and back, plus a ban of light-brown hair around the middle.

A WOOLLY BEAR spends the SUMMER feeding on a variety of weeds and by FALL can be 4cm or more in length. This is a "Centipillar" for measuring Woolly Bears. By cold weather the furry caterpillar has finished eating and is ready to curl up under some fallen leaves for a WINTER rest.



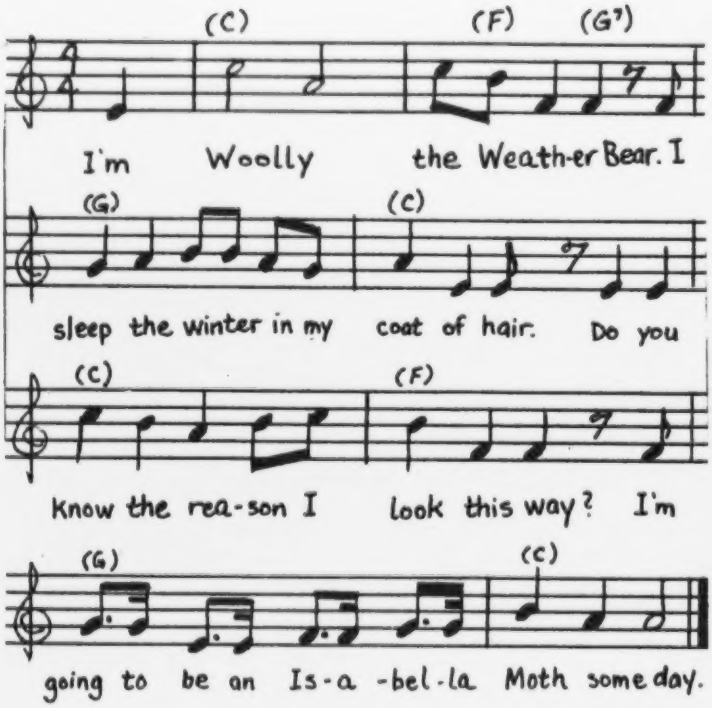
In SPRING the Woolly Bear will make a hairy cocoon!

By warm weather this attractive Isabella Moth will leave the cocoon to mate, lay eggs and begin another family of fuzzy Woolly Bears!



ISABELLA MOTH
Yellow upper wings and pale orange underwings. Body is soft yellow with orange fur capelet near head.

The Curled Up Caterpillar Song

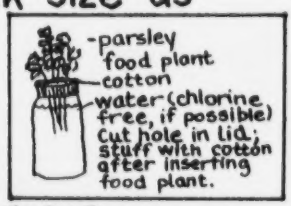

(C) (F) (G7)
I'm Woolly the Weath-er Bear. I
(G) (C)
sleep the winter in my coat of hair. Do you
(C) (F)
know the rea-son I look this way? I'm
(G) (C)
going to be an Is-a -bel-la Moth some day.

Woolly Bears make wonderful temporary pets and can also help with an Overwintering Science Experiment. Follow these simple steps, with further details given in the Teacher/Parent Guide, p. no. 29

Step 1. GO ON A WOOLLY BEAR HUNT!!! Take along a plastic container and an 8cm piece of yarn. Centipillar, p. 20, will help.

Step 2. When WOOLLY BEARS are found, check size as described in Guide.

Step 3. Keep caterpillars indoors at first. Feed parsley or carrot tops and set up food plant jar as shown at right. Place paper towel under jar for easy cleanup. Keep greens fresh. Check daily to see if caterpillars are feeding.



Step 4. When no longer feeding, Woolly Bears should be kept outdoors for WINTER resting period (6 to 8 weeks).

Step 5. When container is brought back inside, it should be gradually warmed. After a few weeks the caterpillars will make a hairy cocoon and finally the children will observe the emerging ISABELLA MOTH!!!

Spotting Six-Sided Snowflakes

Did you know that snow began as tiny dust specks moving around inside a cloud gathering ice?

These ice crystals continue to grow until ✲ six-sided snowflakes are formed. Although as colorless as a drop of clear water, they appear to be white as they catch sunlight on their parachute journey to the ground.

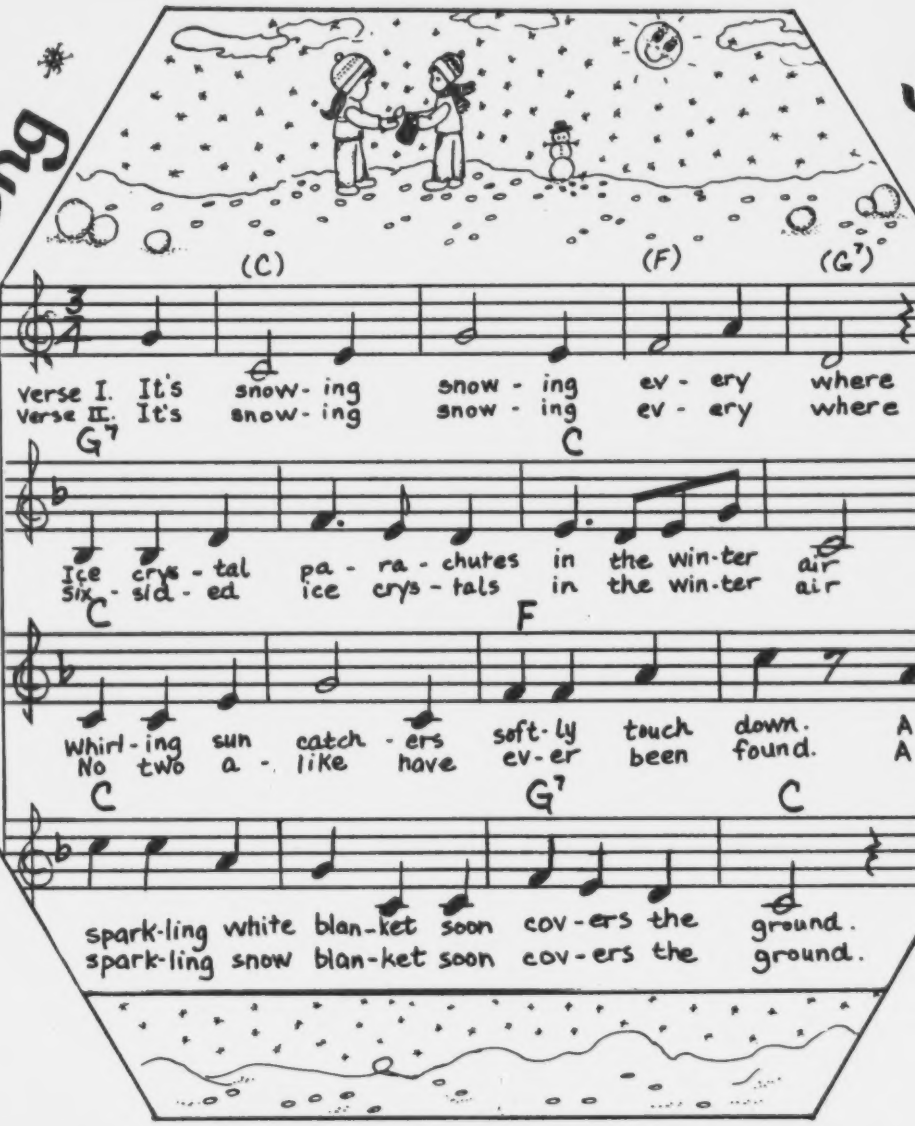
SNOW SCIENCE EXPERIMENT:

Materials Needed: Dark, soft cloth; magnifying glass.

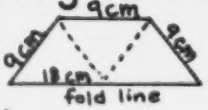
Procedure: Keep cloth cold in plastic freezer bag and wait for snowy day. Catch snowflakes on cloth and magnify with glass. Look for six sides on single snowflakes. ✲

(Note: Some may bunch together or be partially melted.)

Results: Were any two snowflakes alike???

Sing-a-Song of Snowing

Create a Six-sided "Paper" Snowflake

Step 1 Trace 9cm hexagon above, on white paper. Fold in half.

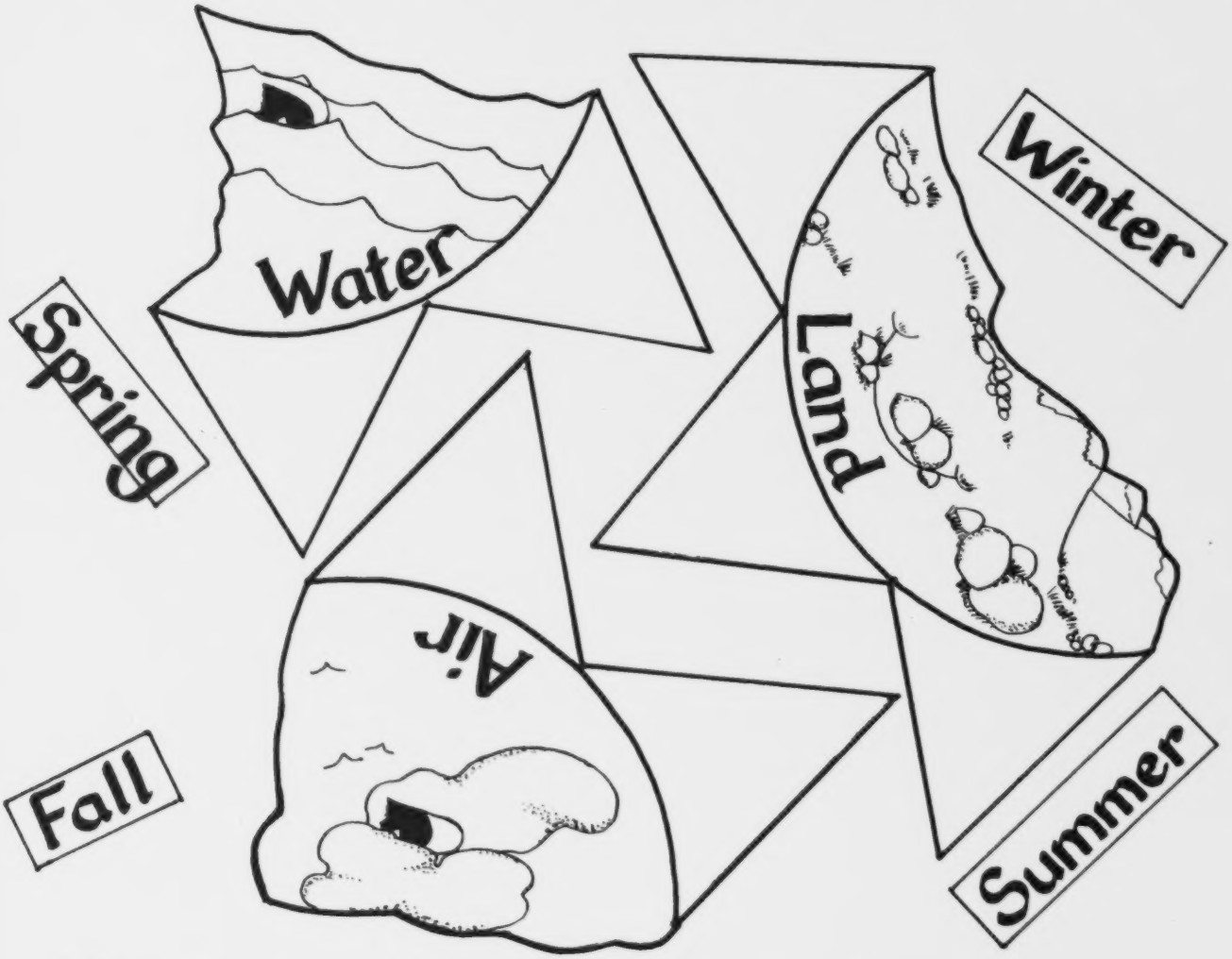


Step 2. Now fold

in thirds.

Step 3. Cut a variety of designs and patterns. The results can be as varied and creative as nature's own ice crystals.

The Weathermakers . . .



After cutting and assembling The Weathermakers Puzzle, please answer the following:

The _____ is the major weather-maker as it acts on _____, _____, and _____ to make different kinds of weather, creating the seasons of _____, _____, _____, and _____.

"Wonder Weed" The Weather Watcher

This is the flower of the carrot plant.
It does a special thing
once its seeds are dried and ready to
go in the FALL, WINTER or SPRING.
On dry sunny days it will open wide
so its seeds can travel the countryside.

But should wet weather be in sight,
it closes up to hold them tight.

WEATHER WATCH SCIENCE EXPERIMENT

Materials Needed — Dried seed-flowers of the carrot plant. Queen Anne's Lace is a common weed. The dried flower can be found in fields in FALL, WINTER or SPRING.

Procedure (1) Spray with water. Time the reaction.

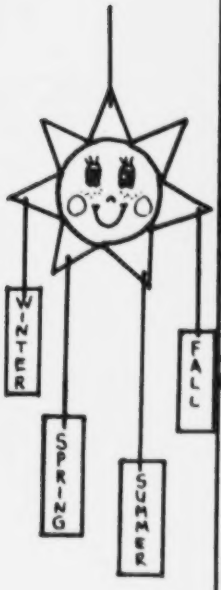
Result (1) It took ___ minutes for the flower to close.

Procedure (2) Set "closed" flower in direct sunlight.

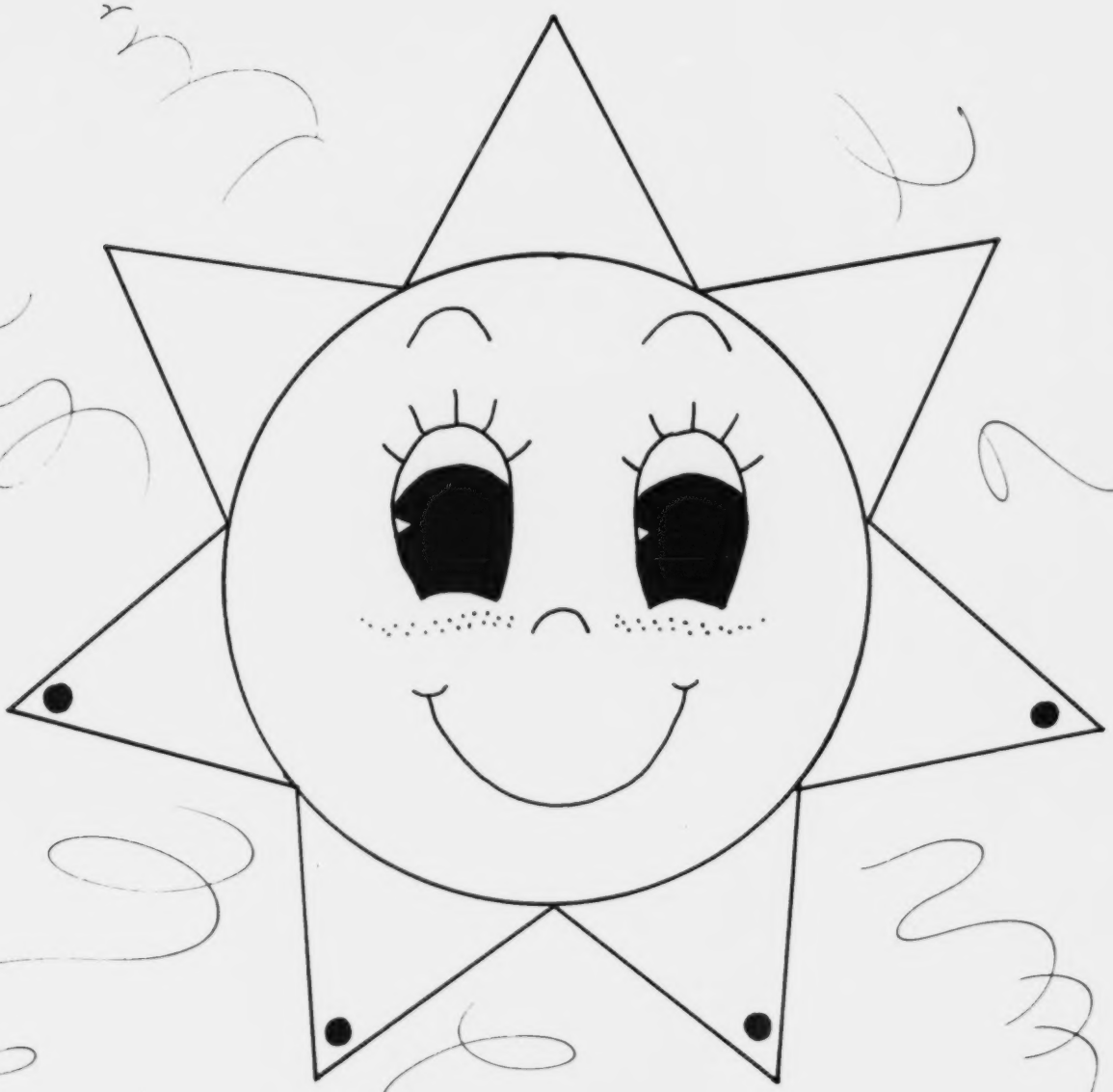
Result (2) It took ___ minutes for the flower to reopen.

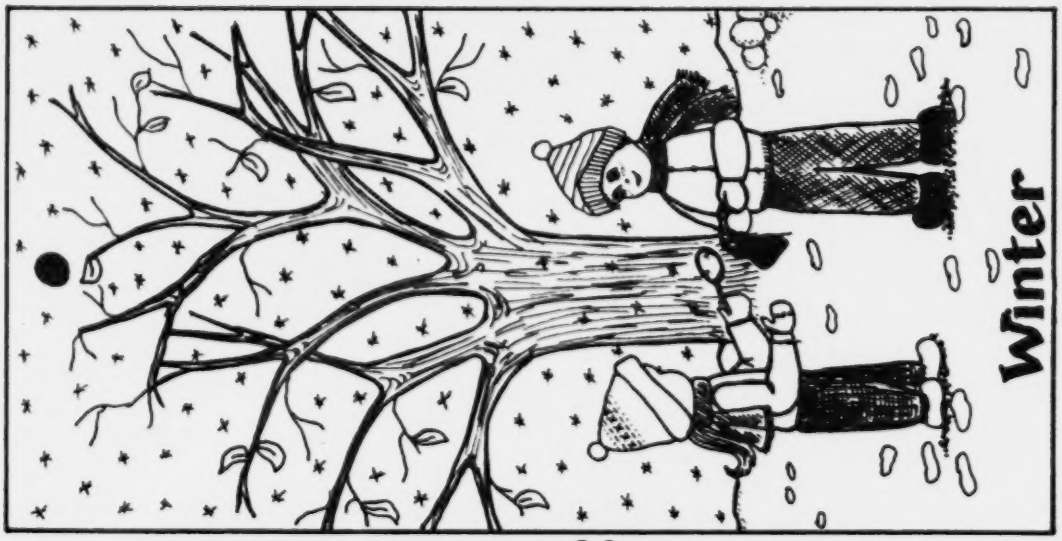
FORECAST THE WEATHER WITH "WONDER WEED"! See Teacher/Parent Guide, p. 30!

Seasons Under the Sun (A Mobile)



Make a mobile and learn this surprising fact- the earth is actually closest to the sun in WINTER and farthest away in SUMMER!




Winter

TEACHER/PARENT GUIDE

SIGNS OF THE SEASON (pp.1-4)

DISCUSSION: Beginning with the present, discuss the seasons that will follow in their appropriate order. Once the order is understood, select a tree growing nearby for an example. An ideal specimen would be a tree that can be seen from a window in the room. (If this is not possible, a tree common to the locality can be suggested.) How does the sample tree look at the present time? How will its appearance be changed by the season that follows? What is the weather generally like during the present season? What changes will occur in the weather in the season that follows? How will these weather changes affect the tree being discussed?

LEARNING ACTIVITY: Covers for the child's own seasonal booklet are provided on pages 2 and 4. Clues to the seasonal colors of the apple tree and surroundings are given on page 3. After the covers are colored for the season indicated, the front cover may be taped to the back to make a folder for holding the remaining activity sheets as they are completed.

VOCABULARY: Spring, Summer, Fall, Winter, weather, change

PLANT A "SEASON TREE" (pp.5-6)

DISCUSSION: Seeds are produced by many trees in the spring and/or fall of the year. Do the children recognize any of the seeds pictured on page 6? (Be sure and discuss the difference in the White and Red Oak acorns and leaves.) Could any of these seeds be collected from nearby trees for a special planting project?

LEARNING ACTIVITY: Before deciding on a type of tree seed to plant, it would be fun and informative for the children to conduct a "tree survey." A survey sheet can be set up by cutting out the leaf and seed pictures on page 6 and gluing them along the side margin of a lined piece of notebook paper. Each child could be a tree surveyor, and a completed survey sheet might look like this.

TREE SURVEY Season = Fall		LOCATION	SEEDS FOUND Yes	No
Maple		School playground	✔	
(seed)	(leaf)			
Crab Apple		Tommy's backyard	✔	
(small apple)	(leaf)			
White Oak		Behind the slide		
(seed)	(leaf)	at the park	✔	
Red Oak		Near Grandma's		
(seed)	(leaf)	bird feeder	✔	

From the collected seeds, pick one type to be planted as the "Season Tree." (Other types may be planted as well and their growing times compared to that of the selected "Season Tree.") Follow the soaking and planting instructions given on page 6 closely. A spray bottle will always be preferable to a watering can when young children are involved. (Remember the seeds of eating apples may be filed, soaked and planted like those of the Crab Apple, but these hybrid seeds may not germinate as quickly or successfully.)

VOCABULARY: seeds, Crab Apple, bitter tasting, edible, sprout, germinate, White Oak, Red Oak, Maple Tree, temperature

THE SEASON TREE FAMILY ALBUM (pp.7-9)

DISCUSSION: Trees are nature's giant plants. Like smaller houseplants grown in the classroom or at home, those with similar leaves, flowers and seeds come from one plant family and will have that family name. Have the children ever seen houseplants called violets? Although the flowers on this type of plant can come in many different colors, the leaves of most violet plants are heart-shaped. Noticing the heart-shaped leaf could help us identify a plant belonging to the violet family. Can the children name the parent tree of the seed they have planted? What do the leaves of this tree family look like?

LEARNING ACTIVITY: The children will be able to assemble a Family Album for their special Season Tree.

The beginning album page has a space for a leaf from a tree in their planted seed's family. To preserve the leaf's appearance, it should be pressed with a warm iron between sheets of wax paper. If the seed-planting project took place in fall, the colors of the leaves on the family trees may be observed and recorded on page 8 in the album. Some children will be interested in noting if changes in leaf color preceded or followed the first "hard frost," when temperatures at night drop below the freezing point. Actually one of the two factors will bring about the change in leaf color, shorter hours of daylight or frost. Either event can produce the same effect: the trees stop using their leaves to make food in preparation for a winter resting period. The green-colored pigment in the leaves (chlorophyll) is no longer present, while the leaves' basic color pigments remain. (Pigment is responsible for the color we see in most living things.) The oranges and yellows we see in the fall are actually the leaves' true colors, minus the food-producing green chlorophyll. In some trees, sugar is trapped in the leaves along with the color pigments; this often results in brilliant red and purple-colored leaves.

The album pages also have sections devoted to the seeds and bark of the family trees, as well as a space for a photograph or drawn picture of the newest member of the family, the "Season Tree Seedling." (A Centimeter Slide Rule for measuring the seedling can be found on page 10.)

VOCABULARY: frost, branches, bark, houseplant, violet, chlorophyll, pigment, seedling, centimeter

HIDE AND SEEK SCIENCE/AGNES APPLE (pp.11-15)

DISCUSSION: After the children have read page 11 and "The Tale of Agnes Apple," pages 13-14, discuss the sequence of events from the opening bud in spring to the "reddest apple of them all" in fall. Don't forget the importance of the honeybee's visit while Agnes was still a blossom. Apple trees are in blossom about ten days, and the bees quickly find the sweet-smelling flowers. What did Agnes do for the honeybee? (Supplied nectar for making honey.) How did the honeybee help Agnes? (Seeds were formed because the bee dropped pollen in her flower blossom.) What should Tommy do with the apple seeds before planting them? (File and soak, page 6) What season is missing from the story? (Winter-resting time for the apple tree when Agnes is just a small, tight bud on a branch.)

LEARNING ACTIVITY: Starting with page 11, Agnes can be found on every activity page in one of her seasonal forms. The children can look for her and see if they can name the season in which she is pictured.
After cutting apart the squence story cards for Part I and Part II, the children can attempt to place them in order while retelling the events that led up to "five Agnes Apple Trees."

EXTENDING ACTIVITIES: A play or flannelboard story can be made of "The Tale of Agnes Apple," giving each child an opportunity to narrate or play one of the story characters. (Agnes, Mr. Sun, honeybee, wind, hungry insect, Tommy)

VOCABULARY: bud, blossom, honeybee, nectar, pollen, traction soles.

SUN-WARMING SCIENCE (pp.16-17)

DISCUSSION: Have the children name ways they think the sun helps living things? What are some of the uses scientists have found for the warm rays of the sun?

LEARNING ACTIVITY: The sun affected all the changes in the life cycle of Agnes Apple. On page 16 the children can fill in the season in which these changes occurred.

Answer Key: (#2) Spring, (#3) Summer, (#4) Fall, (#1) Winter, Spring

EXTENDING ACTIVITIES: As a variation of the sun-warming experiment, the children may want to try containers made of glass or plastic and compare their sun-warming qualities to that of the aluminum soup cans. Does water in a glass, sitting in direct sunlight, heat faster or slower than water in an aluminum soup can? ...an aluminum soup can painted black? Does clear water heat as fast as water that has been darkened with food coloring? (The number of experiments is limited only by the number of questions asked.)

VOCABULARY: solar, energy, furnace, metal, aluminum, glass, plastic

THE WOOLLY BEAR CATERPILLAR (pp.18-21)

DISCUSSION: Have the children ever seen a Woolly Bear Caterpillar? This caterpillar is supposed to forecast a long, cold winter when its hairy coat is very black with just a narrow band of brown in the middle. What would be the best color for the Woolly Bear if it could spend the winter sleeping in the sun? (Black-experiment result, page 17) Woolly Bears actually spend the winter curled up under piles of leaves and sticks. Whether they are mostly black or brown, the sun's warm rays can't usually reach them. How would thick or thin fur on a hairy caterpillar be a better indicator of the coming winter weather?

LEARNING ACTIVITY: Woolly Bears are quite numerous in the early fall and can be used for an interesting overwintering science experiment, page 21. Before hunting for Woolly Bears you will want to prepare the following: Cut the center out of the plastic lid of a large whipped topping container. Place a piece of nylon netting, preferably a dark color, over the container and replace the lid as pictured on page 21. Cut an 8 cm piece of yarn. (Use "centipillar," page 20, to measure yarn. Place the yarn in center of centipillar's head and extend the length to 4 cm by tying a knot there with thread.) When a Woolly Bear is found, approximate its size with the yarn piece and keep the caterpillar only if it is 4 cm or more in length. Caterpillars much smaller than 4 cm usually cannot survive the winter. Note: When placing the caterpillars outside for winter (Step 4, page 21) be sure to cool them down gradually. Care should be taken to warm them gradually when they are brought back inside. (Step 5)

VOCABULARY: Woolly Bear Caterpillar, severe cold weather, survive, food plant, parsley, carrot tops, cocoon, Isabella Moth

SNOW (pp.22-23)

DISCUSSION: Sometimes a beam of sunlight coming into a room will show tiny dust specks moving around in the air. Have the children ever noticed these tiny specks whirling, twirling and tumbling through the air? This is very much like what is happening inside a cloud high above the earth when snowflakes are being formed. The air inside the cloud is very cold and bits of ice stick to the moving specks of dust. They begin to increase in size and eventually six-sided ice crystals are formed, as clear in color as frozen ice cubes. These clear ice crystals catch the light as they fall to the ground and appear white to our eyes. Snowflakes could really be called nature's six-sided suncatchers.

LEARNING ACTIVITY: The best part of the snow-catching experiment (page 22) is that no two snowflakes will ever look alike because of the way they are formed inside a cloud. For two snowflakes to end up identical, a dust speck would have to have the same pattern of movement inside the cloud as a second dust speck. This would be highly improbable since there are millions of dust specks moving every which way inside the cloud, gathering ice as they go. After viewing some of these unique snow crystals, it is fun to cut a special design of your own, page 23, or to play the "Snow Cloud" Circle Game. To play, children sit in a large circle and sing the "Snowing" Song, page 23. Three or four children (depending on group size) whirl, twirl and tumble like dancing dust specks in the center of the circle "cloud." On the final line of each verse in the song, the "dust speck" children become snowflakes. Each places a paper snowflake on the head of a seated child. The children receiving the snowflakes then move to the center and the game begins again until every child has had an opportunity to play.

VOCABULARY: six-sided snowflake, dust speck, cloud, ice crystals, colorless, suncatcher, hexagon

WEATHER WATCH (pp.24-27)

DISCUSSION: Have the children name different types of weather. The sun is responsible in some way for every type of weather we know. (Although the sun is not visible on a rainy day, without the sun evaporating water from the earth, there would be no rain.) Actually every day the sun is acting on the air, land and water to produce the weather we experience in fall, winter, spring and summer. Although the sun is a very great distance from the earth year round, in fall and winter the sun is really closer to the earth than it is in spring and summer when the weather is warmer. This strange, but true fact, has to do with the type of rays the sun produces. Farther away, the warming rays come to us in a tighter beam, making more warmth. When the sun is closer, the tight beam spreads out, resulting in less warmth.

LEARNING ACTIVITY: With supervision the children could try using a magnifying glass to catch sunlight in a beam and direct the light toward an object such as a large rock. When the magnifying glass is moved closer to the rock, the light beam will spread. As the glass is pulled away, the beam will become brighter and focus in a tight circle. This circle of light will become warm if the glass is held in this position for a period of time. If the children think of the rock as the earth, with the magnifying glass as the sun, they will be able to better understand the seasonal distancing.

All living things are affected by the sun and by the weather the sun produces. Many plants and animals could tell us what the weather is going to be like, if we knew how to read the signs they give us. (A good example is the Woolly Bear Caterpillar with a thick hairy coat indicating very cold winter weather.) The flower of the carrot plant, Queen Anne's Lace, goes to seed in the fall. The seed-flower always reacts to the coming of rain by closing up. This is a common weed and its "hitchhiker" seeds are spread by catching on the fur of animals. If an animal's fur is wet, the seed can't stick. This is why the seed-flower closes up and holds its seeds tightly when wet weather is on the way. Please don't miss trying the experiment on page 25. It is fascinating and will make everyone want to watch the "Wonder Weed" both indoors and out for signs of wet weather!

Answer Key: Puzzle, page 24 - sun, air, land, water, Fall, Winter, Spring, Summer.

VOCABULARY: Queen Anne's Lace, seed-flower, evaporating, hitchhiker seed

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